

NAVIGATION.

Stage of Water in Rivers.—In the table on the right-hand side of Chart No. III are given the highest and lowest stages of water, as observed on the Signal Service river gauges during the month of May, 1881. In the Red and Arkansas Rivers the highest stage was reached between the 3d and 9th. In the Missouri, below Yankton, high water, consequent upon the April floods, did not subside until about May 10th. The highest stage at Omaha and Leavenworth was reached on the 1st, the latter being 41 inches above the danger line and the former within 17 inches of it. In the Mississippi the high water of the April floods did not wholly disappear until about May 15th. The highest stage occurred at St. Paul and Memphis on the 1st, and at New Orleans on the 30th; at other stations between the 5th and 17th. The following stations were above the danger line: St. Paul 50 inches; Keokuk 11 inches; St. Louis 44 inches; Cairo 32 inches and Vicksburg 7 inches. In the Ohio the water at the various stations reached its highest stage between the 7th and 11th, accompanied by no dangerous rises. In the Cumberland, Tennessee, Monongahela and Savannah rivers, the highest stages were reached between the 1st and 7th, the water remaining very low throughout the month. The Willamette at Portland, Oregon, reached its highest stage on the 1st.

Ice in Rivers and Harbors.—*St. Clair river:* Port Huron, 2d, heavy ice running all day; drift-ice, 3d to 12th, disappearing on 13th; 5th, small schooner struck and sunk. *Lake Michigan:* Chicago, 4th, 21st. *Lake Superior:* Marquette, 1st, ice moved out of harbor during morning; 5th, ice returned again; 7th, again passed out, steam barge "Northerner" arrived, first of season, reports very hard trip, working through 60 miles of ice, between here and Sault St. Marie; Duluth, 1st to 8th, ice still in harbor; 5th, mail tug "Siskiwit" left port, first departure; 9th, propeller "Maistee" came in port, first arrival; 9th, ice left harbor. *Green Bay:* Escanaba, 3d, ice moved out, navigation opened; 4th, first arrival. *Lake Erie:* Toledo, 9th, navigation fully open. *Lake Ontario:* Buffalo, 1st, navigation opened; 14th, ice disappeared from lake. *Devils Lake:* Ft. Totten, Dak., 7th, ice breaking up; 9th, almost clear; 10th, entirely clear.

Floods.—The terrible devastation caused by the high water in April ceased for the most part with the closing days of the month, although at some points along the Mississippi, notably in the vicinity of St. Louis, the river continued to rise until May 6th, when at that city it was over three feet above the danger line. As will be shown by the dates of lowest water, the effects of the unprecedented floods of April continued their influence upon the Mississippi to a much later period than in the Missouri; the former at every station but two (Dubuque and New Orleans) reached its lowest stage on May 31st, while in the latter it occurred between the 16th and 22d. Floods elsewhere noted were due entirely to the unusually heavy rains of May. *Dakota:* 14th, reports from the recently flooded districts in this state and Nebraska give a most deplorable picture of the country. In northern Nebraska and southern Dakota houses were found scattered around in every conceivable shape; thousands of trees stripped of bark and limbs, and cotton wood trees two to three feet in diameter were uprooted; thousands of acres of once beautiful farms apparently converted into barren sand bars and vast lakes of water. At the town of Green Island, where but one solitary house remained, huge cakes of ice were still found. Springfield, 26th, Emanuel creek rose 10 feet during the night, caused either by a "cloud burst" or exceedingly heavy rains up the valley. Five buildings were carried away and all the bridges along the creek. Two persons were drowned. 2,800 feet of railroad embankment was washed out, carrying away the rails and ties. *Iowa:* Dubuque, 11th, water 16 feet 7 inches above low water mark, or six feet lower than the great rise of June, 1880. No serious damage yet, but many mills obliged to shut down. Keokuk, 14th, Keokuk and St. Louis Railroad flooded near Gregory's Landing, where the track was several feet under water. *Idaho:* Eagle Rock, 4th, first mail since April 26th, owing to high water on the Portneuf and Snake rivers. *Kansas:* Dodge City, 14th, Arkansas river overflowed its banks for the first time within the memory of the oldest inhabitants. Yates Center, 19th, 20th, very heavy rains, river overflowed; dam at Neosha falls swept away. *Louisiana:* Alsatia, 5th, levee broke; river over a mile wide, 22 inches deep at points along the Vicksburg and Shreveport railroad. *New Brunswick:* New Castle, 21st, Miramichi river and its tributaries higher than for many years; considerable damage caused to logging interests; overflow due to the heavy rains of past week, together with the rapid melting of large quantities of snow in the forests. *Missouri:* St. Louis, 2d, water in river one foot and a half above the danger line and still rising; low lands south of Choteau avenue and east of the high embankment of the Iron Mountain railroad submerged; the Meier Iron Works on the eastern side of the river opposite Carondelet surrounded by water; operations suspended; most of the lumber yards flooded; Cahokia Creek overflowed, submerging a large extent of territory in the neighborhood of Brooklyn and Venice (two small towns north of East St. Louis); many houses abandoned. 3d, water still rising slowly; East Carondelet entirely submerged; 200 persons leaving their houses; in northern part of city about fifteen industrial establishments were obliged to suspend operations; the situation in East St. Louis remains about the same. 5th, levee along the river bank opposite Nameokie, broke during the morning, overflowing all the bottom lands between the Chicago and Alton rail-

road track and the river; crevasse 50 feet wide and several feet deep; no change at East St. Louis. 6th, Madison levee broke about 4 a. m.; crevasse 50 feet wide; the settlements of Canteen and Indian creeks flooded; about 15,000 acres of farming land under water. Hannibal, 6th, the break in the Sny levee stopped during the night; water in the submerged districts receded ten inches within an hour. *Nebraska*: Omaha, 13th, very heavy rains; streets and cellars flooded. *Wisconsin*: La Crosse, 2d, river 11 feet 7 inches above low-water mark, and rising slowly; both railroad tracks covered with water; all traffic stopped; river filled with old snags, piles of brush, logs and driftwood; current very rapid.

TEMPERATURE OF WATER.

The temperature of water, as observed in rivers and harbors at Signal Service stations, with the average depth at which observations were taken, is given in the table on the left-hand side of chart No. III. Owing to breakage of instruments, observations are wanting of follows: Savannah, 1st to 12th; San Francisco, 1st to 31st.

ATMOSPHERIC ELECTRICITY.

Thunder-storms.—In the various districts they were reported on the following dates: New England, 2d, 5th, 6th, 8th to 13th, 15th to 18th, 22d to 24th, 25th, 27th, 29th, 30th, 31st. Middle Atlantic States, 2d, 9th, 10th to 16th, 20th, 21st, 22d, 26th to 31st. South Atlantic States, 2d to 4th, 6th, 10th, 13th to 17th, 19th, 22d to 25th, 28th to 31st. Florida, 2d, 5th, 6th, 14th, 15th, 20th, 22d, 26th to 31st. Eastern Gulf States, 1st to 11th, 14th, 15th, 21st to 26th, 29th, 30th, 31st. Western Gulf States (including Texas), 1st to 12th, 16th to 31st. Ohio valley and Tennessee, 1st to 10th, 12th to 14th, 22d to 24th, 26th to 31st. Lower Lake region, 5th, 8th to 14th, 28th, 31st. Upper Lake region, 7th to 9th, 11th to 14th, 26th, 27th, 29th, 31st. Upper Mississippi valley, 1st, 2d, 4th, 7th to 14th, 16th, 19th, 21st to 31st. Lower Missouri valley, 1st to 23d, 26th to 31st. Southern Slope, 1st to 3d, 12th to 15th, 17th, 18th, 22d, 24th, 25th. Middle Slope, 1st, 6th, 8th, 9th, 10th, 15th, 16th, 23d to 26th, 28th to 30th. Northern Slope, 3rd, 4th, 6th, 8th, 9th, 10th, 15th, 22nd, 24th to 31st. Southern Plateau, 14th, 15th. Middle Plateau, 9th, 10th, 15th. Northern Plateau, 3rd, 4th, 8th, 12th, 20th, 22nd, 27th, 30th. Southern Pacific Coast region, 14th, 15th, 16th, 17th. Middle Pacific Coast region, 1st, 15th, 21st to 24th. Northern Pacific Coast region, 27th.

The following items of interest connected with the peculiar manifestations of electricity during the progress of thunder-storms were obtained from various sources: Manhattan Beach, Coney Island, N. Y., 12th, late in the afternoon a thunderbolt descended among a gang of 15 laborers, killing one of them instantly, seriously injuring another, whose hair was almost entirely burned off, and severely stunning the remainder. Hartford, Conn., 12th, six barns and one house struck and burned; loss about \$12,000. Columbia, S. C., 31st, atmosphere appeared to be unusually charged with electricity. One explosion after another followed in quick succession, and at times the heavens seemed to be on fire. One residence was struck, the electricity making quite a hole in the roof and scattering the shingles in the street. The wainscoting and cornices in the parlor were knocked from their places and broken and the papering was scorched and smoked. The ceiling above was perforated at two points on opposite sides of the room. The current descended the lightning-rod, tore up the pavement in the yard scattering the bricks about and bursted the water pipe in the basement. The water main in the middle of the adjoining street, and over 30 feet from the house, was broken in three places, causing the water to rush out in great force. Several persons were more or less stunned. Fort Stockton, Tex., 17th, infantry quarters struck, tearing the plaster from the walls and slightly injuring one man; 18th, the lightning knocked a gun from the hands of one of the men, throwing it several yards away; an officer, while crossing the parade ground at the same time, received a slight shock and was obliged to cast away his sabre to prevent the electricity from playing around him. Boston Mountain, Ark., 14th, two men killed while plowing in a field, the stroke fracturing every bone in their bodies. Springfield, Dak., 26th, two buildings struck; in the first, the electricity passed down one of the chimneys, forcing out the gable end of the building; it then proceeded through the floor into the kitchen, tearing the plastering off the ceiling and turning a large cook stove completely around. The second building was struck upon the ridge, the electricity passing downward through the centre of the house, carrying away the whole front end. The occupants of both houses received but slight shocks. San Antonio, Tex., 5th, switch boards damaged by lightning; stable and horses burned. Galveston, 8th, several persons severely shocked. St. Paul, 14th, barn struck, killing 25 horses, several other buildings damaged. La Crosse, 28th, church spire entirely demolished. Memphis, 22d, struck iron foundry, completely destroying new lightning-rod. Albany, 25th, several buildings shattered. Boston, 30th, barn struck, several persons killed and injured. Fallston, Md., 31st, two miles northeast of station, barn struck and burned. horses and cattle killed in the field. Cincinnati, 11th, several buildings struck. Columbia, S. C., 28th, two women struck, tearing the shoes from the feet of one of them, but neither were killed.